



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/553,362

06/13/2007

Karl Brotzmann

16148.7.1

1221

22859

7590

03/30/2010

INTELLECTUAL PROPERTY GROUP

FREDRIKSON & BYRON, P.A.

200 SOUTH SIXTH STREET, SUITE 4000

MINNEAPOLIS, MN 55402

EXAMINER

YANG, JIE

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

03/30/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/553,362	Applicant(s) BROTZMANN, KARL	
	Examiner JIE YANG	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 February 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/22/2010 has been entered.

Status of the Claims

Claim 1 has been amended; and claims 1-13 remain for examination.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 3 are rejected under 35 U.S.C. 102 (b) as being anticipated by Deloche et al (US 6,030,431, thereafter US'431).

Regarding claim 1, US'431 teaches a method for improving energy input in heating and melting of scrap bulk (Abstract of US'431), which includes burning a channel into scarp bulk with oxygen-containing gas (abstract of US'431), adding fossil fuel (Col.2, lines 16-17), and inputting additional energy for the heating and melting of the scrap bulk (claim 1 of US'431).

Art Unit: 1793

Regarding the limitation of "hot blast", this limitation can be read as additional energy taught by US'431. The channel is formed in the upper area (Col.3, line 43), and US'431 specifies that: "In general, the gas introduction nozzles can be installed anywhere, but preferably are installed at least 30 cm above the bath surface--when using oxygen, at least 80 cm above the bath surface." (Col.3, lines 61-65 of US'431), which reads on the amended limitation of the hot blast being supplied from a top position as recited in the instant claim.

Regarding claim 3, US'431 teaches two hot draft jets (Col.4, lines 3-4), which reads on the hot blast being divided into several separate jets as recited in the instant claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over US'431.

Art Unit: 1793

Regarding claim 2, US'431 does not disclose that the hot blast supply occurs centrally from the top. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to locate the hot blast supply centrally from the top because US'431 teaches: "In general, the gas introduction nozzles can be installed anywhere, but preferably are installed at least 30 cm above the bath surface--when using oxygen, at least 80 cm above the bath surface." (Col.3, lines 61-65 of US'431).

Regarding claim 11, US'431 does not teach the blast velocities for the two phases. The exit velocity is 600m/s (Col.2, line 11). The reduction is at least 10-30% (Col.3, line 17), which reads on 420-540m/s. It would have been obvious to one of ordinary skill in the art at the time the invention was made that the claimed range is taught by US'431, since in the case where the claimed range overlap or lie inside ranges disclosed by the prior art, a prima facie case of obviousness exists. See MPEP 2144.05.

Regarding claim 12, US'431 teaches adding 30% of oxygen (Col.3, line 45) and fuel subsequently (Col.3, line 48 of US'431), which is within the claimed 30-50% oxygen range as recited in the instant claim. US'431 is silent with respect to oxygen enrichment, which meets the limitation of no or hardly

Art Unit: 1793

any oxygen enrichment in phase 2 as recited in the instant claim.

Regarding claim 13, US'431 does not teach the distance of the hot blast jet to the surface in phases 1 and 2. However, US'431 teaches at least 80cm (Col.3, line 63) from the bath surface. It would have been obvious to one of ordinary skill in the art at the time the invention was made that the claimed range is taught by US'431, since in the case where the claimed range overlap or lie inside ranges disclosed by the prior art, a prima facie case of obviousness exists. See MPEP 2144.05.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over US'431 in view of JP 01219116 A thereafter JP'116.

US'431 discloses the invention substantially as claimed. However, US'431 does not disclose distributing hot blast through a central jet with 35-65% of the total amount as claimed. JP'116 teaches a converter refine method. To enhance a secondary combustion ratio and to increase the compounding ratio of scrap by specifying the height position of a lance nozzle having main holes and auxiliary holes and specifying the angle of the oxygen jet to the blown through the auxiliary holes 3 is specified to 30-60° with perpendicular and the oxygen flow rate ratio through

Art Unit: 1793

the auxiliary holes expressed by the equation (the total oxygen flow rate = the oxygen flow rate through the main holes + the oxygen flow rate through the auxiliary holes) is specified to 65-80% (abstract of US'431). It would have been obvious to one of ordinary skill in the art at the time the invention was made that the oxygen in the central jet in US'431 would be 20-35%, since JP'116 teaches enhancing a secondary combustion ratio and to increasing the compounding ratio of scrap.

Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over US'431 in view of Kundrat et al (US 5,702,502, thereafter US'502) and Hirai et al (US 4,334,921, thereafter US'921).

US'431 discloses the invention substantially as claimed. However, US'431 does not disclose supplying hot blast via a vertically adjustable lance as in claim 5 or rotating around the vertical axis as in claim 6. US'502 teaches a lance used to inject oxygen gas (Abstract of US'502). It would have been obvious to one of ordinary skill in the art at the time the invention was made to inject oxygen gas with a lance, since using lances to inject oxygen gas in converters is well known as taught by US'502 (Col.1, lines 52-54, Col.2, lines 18-21, and lines 37-38 of US'502). US'921 teaches a converter steelmaking

Art Unit: 1793

process. The height of the oxygen blowing lance is controlled depending on the type of steel to be made and the flow rate of the bottom blown gas (Col.2, lines 1-13). It would have been obvious to one of ordinary skill in the art at the time the invention was made to vertically adjust the lance or rotate the lance, since making a device adjustable is not a patentable advance, and US'921 teaches that the type of steel to be made is related to the height of the lance.

Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over US'431 in view of Stercho (US 20020088102 A1, thereafter PG'102).

US'431 discloses the invention substantially as claimed. However, US'431 does not disclose a hot heel as in claim 7 or a hot heel of 10-30% as recited in claim 8. PG'102 teaches that a maintaining a liquid metal heel in the furnace (Paragraph [0027] of PG'102). It would have been obvious to one of ordinary skill in the art at the time the invention was made to maintain the heel as taught by PG'102, since PG'102 teaches that a liquid metal heel provides a substantial thermal benefit after tapping to maintain flat bath operation throughout the charging of scrap and/or other forms for charging material (Paragraph [0027] of PG'102).

Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over US'431 in view of Hikosaka et al (US 4,908,059, thereafter US'059).

US'431 discloses the invention substantially as claimed. However, US'431 does not disclose injecting with bottom blowing tuyeres as in claim 9 or the installation as in claim 10. US'059 teaches melting cold iron material (title of US'059) such as scrap (abstract of US'059). Oxygen is injecting via lower oxygen injection holes for combustion (Col.5, line 9). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include bottom blowing tuyeres in the process of US'431, since US'059 teaches that the sensible heat of the combustion gas is used to preheat the iron material phase in the furnace as it climbs therethrough (Col.5, lines 10-14 of US'059).

Response to Arguments

Applicant's arguments filed on 2/22/2010 with respect to claims 1-13 have been fully considered but they are not persuasive. Regarding the arguments related to the amended feature in the instant claims, the Examiner's position is stated as above.

Applicant argued that it is apparent that US'431 does not teach orienting a hot blast from the top position because US'431 supplies gas from the side walls of the vessel and not from the top of the scrap bulk. In response, as pointed out in the rejection for the instant claim 1, US'431 specify that: "In general, the gas introduction

Art Unit: 1793

nozzles can be installed anywhere, but preferably are installed at least 30 cm above the bath surface--when using oxygen, at least 80 cm above the bath surface.” (Col.3, lines 61-65 of US’431), which reads on the limitation of charging hot blast to the scrap bulk “from the top position” as recited in the instant claim.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jie Yang whose telephone number is 571-2701884.

The examiner can normally be reached on IFP.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Roy King can be reached on 571-2721244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JY

/ Roy King/

Application/Control Number: 10/553,362

Page 10

Art Unit: 1793

Supervisory Patent Examiner, Art Unit 1793